

relatively broader antennal segments, III, 4.03-4.24 and IV, 3.14-3.19 times as long as wide compared with 4.38 and 4.0 respectively in *distans* and II, 1.23-1.24 times as long as IV, compared with 1.09; the relatively shorter head 2.20-2.35 times as long as greatest width compared with 2.6

Records and descriptions of South African Thysanoptera — II.

by

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Arhipidothrips brunneus spec. nov. (figs. 1-3).

Female (macropterous). Length 1.8 to 1.9 mm. (distended). *Colour*: general colour brown, wings banded, first four antennal segments almost white. Head brown, eyes so dark red as to appear black, mouth-cone and palpi brown. Antennae: i very pale grey, ii, iii and iv practically white, transparent; pedicel of iii yellow; extreme base of iv (about 3 μ) grey, and about 3 μ at apex of iv tinged with very pale brown; v to ix light brown, viii and ix slightly paler, v with sub-basal paler yellowish band about 4 μ in length.

Prothorax slightly paler than head, with bright red hypodermal pigment. Pterothorax about as dark as head at sides, dorsal aspect largely yellowish brown. Wings: fore-wing with three grey-brown transverse bands, of which the middle one is darkest, as illustrated; hind-wings: scale grey, apical third faintly greyish, basal two-thirds clear. All legs brown, about as dark as head, except tarsi yellowish brown, hind coxae yellow, all trochanters and extreme bases of all femora yellow.

Abdomen: i yellow, tinged with brown, with white hypodermal pigment visible over black paper; ii to ix uniformly light brown, about like prothorax, with transverse lines of bright red hypodermal pigment in intersegmentalia between iii to ix; x and xi greyish yellow; bristles at apex yellowish brown.

Head wider than long, the length about 0.9 of the width near base; head about 0.9 as long as prothorax. Eyes prominent, moderately bulging, their dorsal length about 66 μ , ventral length 112 μ ; broadly rounded on inner dorsal posterior angles, strongly

produced ventrally into V-shaped points to within about $14\ \mu$ of the clypeal suture; dorsal facets smaller, not contiguous, ventral facets larger, contiguous; five large yellow facets (visible in specimens cleared in NaOH), three close together on anterior ventral margin, of each eye, two near middle of ventral aspect.

Ocelli prominent, posterior pair about $20\ \mu$ long, anterior $8\ \mu$; posterior pair about $30\ \mu$ apart, distance between anterior and posterior about $22\ \mu$; vertex raised in region of posterior ocelli, sloping down sharply to base of antennae. Surface of head faintly transversely striate, surface minutely granular.

Antennae long and slender, similar to those of *A. talithae* spec. nov. (fig. 4); length of segments iii and iv variable in both species, but those of *brunneus* are in most cases about 10 to $20\ \mu$ shorter. Sensillae of iii and iv gently undulating, slender, not more than $3\ \mu$ wide, length varying from 33 to $60\ \mu$ on iii and from 56 to $60\ \mu$ on iv, as compared with 76 to 92 and 76 to $104\ \mu$, respectively in *A. talithae*. Segment v bears a long slender sense-cone on ventral aspect (on the drawing of *talithae*, fig. 4, this resembles the sensillae of iii and iv, but it is a true sense-cone), more slender and finely pointed than the cone on segment v of fig. 4; one rudimentary cone on outer side of v; vi bears a slender long cone on inner side, ventrally, and a rudimentary cone on outer side; vii one slender cone on outer side.

Mouth-cone broad and heavy, similar to that of *A. talithae* (fig. 6). Maxillary palpi two-segmented, although distal segment shows four to six pseudo-segments; lengths (widths) of 1st and 2nd segment 28 (12), 41 (8) μ . Labial palpus similar to that on fig. 6, but third and fourth segment not so distinctly separated.

Prothorax sub-rectangular, as illustrated, surface minutely granular, not striated, wider than long, length about 0.9 of the greatest width; width on anterior margin about 44 to $60\ \mu$ greater than width on posterior margin. Mesonotum minutely striate; in anterior half striae transverse, anastomosing, and closely set with minute spinules pointing backwards; posteriorly the striae are smooth and most of them converge backwards to the median point of the mesonotum. Metanotum raised in centre, the sub-triangular raised portion striate like posterior part of mesonotum.

Fore-wings as illustrated (fig. 1), veins and cross veins prominent; hind-wings narrow, about $75\ \mu$ wide near apex and about $55\ \mu$ near base, length about 0.9 mm. Legs normal, slender, fore-femora slightly enlarged, fore-tarsus with usual aeolothripid claw. All legs with minute setae arranged in transverse rows; these especially well developed on hind tibiae and femora; but not present on abdomen of female in *brunneus* or *talithae*.

Abdomen vespiform; widest (about 0.5 mm.) at v and vi; iii and iv about 0.4 and 0.46 mm. wide; i about 0.2 mm. wide; viii about 0.42 mm. wide at base, 0.26 at apex; ix, width at base 0.22, at apex

0.12 mm.; x about 90 μ wide at base, 60 at apex. Segment ix rather strongly concave on anterior margin of tergite, dorsal median length only about 80 μ ; x also 80 μ long, iv to viii about 120 μ , i to iii about 100 μ long. Setae inconspicuous, except 3 pairs near hind margin of ix and 2 pairs near middle of x, which are about 140 to 150 μ in length; there are additional shorter setae on ix and x, and a pair about 70 μ long, and finely pointed, on the hind margin of x, at sides, is borne in a circular roughened thickening, suggesting a spiracle, about 8 μ in diameter. Sternites ii to viii each with about 4 pairs of setae, about 30 μ in length, on hind margin.

Measurements of holotype (female) in mm.: Length 1.96 mm. Head length 0.168, width across eyes 0.176, greatest width 0.192; prothorax length 0.196, width 0.22, pterothorax length 0.38, width 0.31; fore-wing length 1.04, width at narrowest point 0.1, at widest point 0.18; abdomen length 1.22, width 0.5. Legs: fore-femur length 0.22, width 0.08; tibia length 0.2, width 0.06; hind-femur length 0.32, width 0.06; tibia length 0.34, width 0.04.

Antenna length 0.54 mm.

segment	i	ii	iii	iv	v	vi	vii	viii	ix
length in μ	28	44	160	108	88	32	24	16	16
width in μ	36	28	20	16	24	20	16	12	8

Male (macropterous). Length 1.12 to 1.38 mm. (distended). *Colour:* General colour brownish yellow and yellow, much paler than the female. Head and thorax brownish yellow; eyes black in transmitted light, over black paper, white, with pale red underlying pigment; ocellar "crescents" bright red. Antennae: i and ii pale grey, iii pale grey in basal half, becoming gradually darker distally, grey-brown at apex; iv to ix grey-brown, viii and ix slightly paler; iv and v with basal "ring", about 3 μ long, brown, and adjoining it, a transparent pale grey band, about 3-5 μ in length.

Wings: fore-wings with three grey bands, similar to those of female, but the middle grey band is relatively longer in the male, and the distal grey one is relatively shorter: male, median grey 0.3 of total length, female 0.25; distal grey male 0.23, female 0.32 of total length. The median grey area of the fore-wing in the male is uniformly grey; in *A. talithae* spec. nov. this median band is distinctly paler in the middle; in *talithae* the apical dark band of the male is distinctly paler in its distal fourth, but in *brunneus* it is uniformly grey and extends to the tip of the wing. Hind-wing indistinctly banded with pale grey more or less like the fore-wing. Legs brownish yellow, shaded with grey-brown in patches; middle tibiae and tarsi darkest, uniformly grey-brown. Abdomen greyish yellow, paler than thorax, testicles orange.

Head nearly as wide as long, cheeks less rounded than in female. Eyes similar to those of female, but ventral length about equal to dorsal length, i.e. not produced so far backwards ventrally,

although ventral shape similar to that of female. Antennae as illustrated (fig. 2), similar to those of female. Sensillae on iii and iv variable in length, ranging from 32 to 48 μ and 36 to 64 μ respectively, but shorter than in *A. talithae*, in which they vary from 60 to 112 (iii) and 92 to 128 μ (segment iv). The lengths of segments iii, iv and v are also variable in both species, but they are shorter in *brunneus*, as shown below, lengths in μ :—

segment	iii	iv	v
<i>brunneus</i>	124-158	100-132	96-104
<i>talithae</i>	158-220	152-204	124-158

Palpi similar to those of female, maxillary: segment i about 28 x 14 μ , ii about 30 x 8 μ ; labial palpi about 24 μ in length.

Prothorax slightly wider than long. Mesothorax rounded at sides, metathorax slightly concave. Wings similar to those of female, but dark and pale bands slightly different, as stated above. Legs normal. Abdomen slender, segments iv to vi widest (about 230 μ); segment i with prominent median tergal plate about 166 μ long, 78 μ wide at anterior end and 95 μ wide at posterior end; segment ix about 132 μ wide and 83 long, x about 88 wide and 66 μ long. Abdominal sternites, and tergites ii to viii at sides, anteriorly, with rows of minute microsetae.

Segment ix of abdomen with 3 pairs of long bristles (about 50 to 78 μ) dorsally near caudal margin; ventrally with about 7 pairs not quite as long; x with two pairs, dorsally, near middle, about 106 μ long, and a pair about 83 μ long near postero-lateral angle borne on circular thickenings, similar to those of female. Setae on tergites iii to viii inconspicuous, about 11 μ in length. Sternites iii to viii each with 3 pairs of setae on caudal margin, about 22 to 33 μ in length.

Measurements of allotype (male) in mm.: Length 1.32. Head length 0.168, width across eyes 0.156, greatest width 0.16; prothorax length 0.136, width 0.176, pterothorax length 0.28, width 0.24; forewing length 0.8, width at narrowest point 0.072, widest point 0.112; abdomen length 0.72, width 0.23. Legs: forefemur length 0.18, width 0.06; tibia length 0.18, width 0.04; hind-femur length 0.26, width 0.05; tibia length 0.28, width 0.04.

Antenna length 0.54 mm.

segment	i	ii	iii	iv	v	vi	vii	viii	ix
length in μ	32	44	154	124	100	28	24	12	12
width in μ	32	28	20	20	22	20	18	12	8

Described from 8 females, and 6 males, all macropterous, collected by C. F. Jacot-Guillarmod at Hluhluwe, Zululand, in grass sweepings on 24.II.1937.

This species is closely related to the genotype *A. tenuicornis* Bagnall (Annals and Mag. of Nat. H. Ser. 10 vol. X p. 289, 1932), but the female differs in having the first two antennal segments much paler, and segments iii, iv and v of the antennae about

154-168, 104-108 and 76-88 μ long, respectively, as against about 110, 72 and 60 μ in *tenuicornis*. I am indebted to Mr. F. Laing of the British Museum for comparing some of my specimens of *A. brunneus* and *A. talithae* with the type of *tenuicornis*. The new species differs from *talithae* spec. nov. in the much darker colour of the female, in having the tip of the fore-wing dark in both sexes, in the length of the intermediate antennal segments, and the sensillae of iii and iv, as indicated in the description above.

Arhipidothrips talithae spec. nov. (figs. 4-6).

Female (macropterous). Length 1.56 to 1.88 mm. (distended). *Colour*: General colour yellow and light brown, wings banded, last five antennal segments brown. Head yellow to brownish yellow or orange; eyes white (in reflected light), underlying pigment black (in transmitted light); ocellar crescents orange; mouth-cone shaded brown, black at tip, palpi grey to brown. Antennae i pale yellow; ii yellow; iii darker, greyish yellow, shaded grey at apex (especially in apical 15 μ); iv white; v to ix brown, v darkest, vii to ix paler, v with short clear sub-basal band similar to that of *A. brunneus*.

Prothorax largely yellow, shaded light brown on all four margins; in darker specimens prothorax pale orange brown; mesothorax yellow like head, metathorax light brown especially at sides. Fore-wings with three transverse grey bands, basal one about 180 μ long, its distal margin deeply emarginate; pale area about 96 μ , median grey band 248 μ long, but not uniform, consisting of basal (28 μ) and distal (55 μ) darker portions, and a median paler, yellow portion; second pale area about 83 μ long, third grey band about 207 μ , distal pale area (not as clear or as well defined as two other clear areas) about 60 μ . These measurements from holotype; length and shape of dark bands somewhat variable. Hind wings clear, slightly greyish in distal fourth.

Legs: fore-legs yellow to brownish yellow, coxae pale brownish yellow; middle coxae and most of tibiae brownish yellow, femora yellow, shaded brown, tarsi yellow; hind coxae yellow, femora yellow with prominent brown shading, tibiae pale brown in basal two thirds, rest yellow, tarsi yellow.

Arhipidothrips brunneus spec. nov.

Fig. 1. Right fore-wing, female, holotype.

2. Left antenna, ventral aspect, male, paratype.

3. Head and prothorax, female, paratype, (leg setae omitted).

Arhipidothrips talithae spec. nov.

Fig. 4. Left antenna, ventral aspect, female, paratype.

5. Head and prothorax, male, allotype.

6. Mouth-cone, from left side, female, paratype.

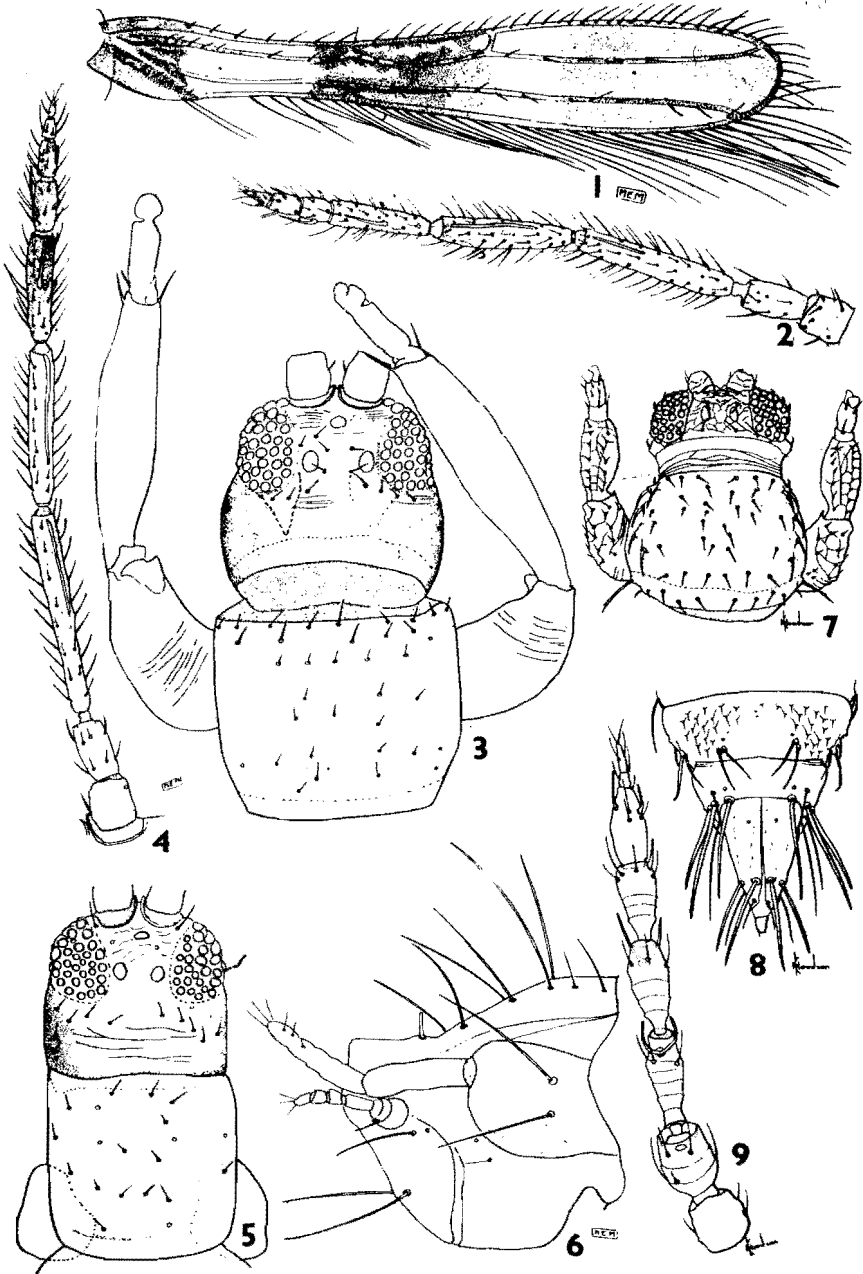
Dendrothripoides venustus spec. nov.

Fig. 7. Head and prothorax, female, paratype.

8. End of abdomen, dorsal aspect, female, paratype.

9. Right antenna, female, paratype.

(Figs. 1-6 Miss M. E. Moberly, del. Figs. 7-9 Miss K. Howitson, del.)



orange-grey, with brown shading posteriorly. Antennae: i and ii pale yellowish grey; iii grey to brown, pale at base and gradually darker towards tip; iv and v brown with very short clear sub-basal band; vi-ix grey-brown, about as dark as tip of iii. Thorax orange to yellow, tinged with brown at sides. Wings: fore-wings similar to those of female, basal and median pale bands about $96\ \mu$ long, distal not very clearly demarcated, about $40\ \mu$ long. Hind-wing transparent, lightly shaded grey in distal fourth. Legs: yellow, shaded with brown; basal two-thirds of hind tibiae darkest. Abdomen greyish yellow to orange-yellow, ix and x somewhat darker.

Head and thorax as illustrated (fig. 5). Head slightly longer than wide and longer than the prothorax. Antennae: similar to those of *A. brunneus* (fig. 2) except as indicated in description of latter above. Fore-wings: finely-granulated area present near centre of median grey band, but only about $40\ \mu$ in length and less densely granulated than in female; absent from wing of male *brunneus*.

Measurements of allotype (male) in mm.: Length 1.32 mm. Head length 0.176, width across eyes 0.152, greatest width 0.156; prothorax length 0.158, width 0.152; pterothorax length 0.28, width 0.22, fore-wing length 0.78, width at narrowest point 0.06, at widest point 0.104; abdomen length 0.74, width 0.2. Legs: fore-femur length 0.2, width 0.07, tibia length 0.2, width 0.04; hind-femur length 0.26, width 0.06; tibia length 0.28, width 0.04. Antenna length 0.68 mm.

segment	i	ii	iii	iv	v	vi	vii	viii	ix
length in μ	36	48	196	176	158	20	16	16	12
width in μ	32	28	20	20	22	20	16	12	8

Described from 36 females and 9 males, all macropterous, collected as follows: by C. F. Jacot-Guillarmod: 13 ♀♀ 2 ♂♂ Hluhluwe, Zululand, 24.II.1937 in grass sweepings; by the writer: 17 ♀♀ 6 ♂♂ Lourenco Marques, P.E.A., 1.VII.1936 on the grass *Urochloa* sp.; 5 ♀ Vila de João Belo (Chai Chai) P.E.A., 19.VII.1930, on grass; 1 ♀ Chinanganine P.E.A. 21.VII.1930, on grass; 1 ♂ Magude, P.E.A., 21.VII.1930, on grass.

Arhipidothrips talithae spec. nov. differs strikingly from *brunneus* spec. nov. and *tenuicornis* Bagnall in its yellow coloration and in the other characters referred to above in the descriptions of the two new species. I take great pleasure in naming this attractive new form after my mother.

***Dendrothripoides venustus* spec. nov. (Figs. 7-9).**

Female (macropterous). Length 0.826 mm. (not distended) to 1.02 mm. (slightly distended). *Colour*: General colour yellow, abdomen brownish yellow, its tenth segment light brown, wings largely grey-brown. Head, over black paper, white, eyes deep red. Antennae: i pale yellow; ii-v and basal two-thirds of vi yellow; apical third of vi grey-brown, vii and viii grey. Mouth-cone

greyish yellow, labrum brown, palpi yellow. Pronotum yellow, lightly shaded brown at sides; pterothorax yellow with orange to pale brown shading. Legs yellow. Wings: large median area of forewings brownish grey, about $320\ \mu$ long and equal to about two-thirds of wing length; basal portion $80\ \mu$ long and scale clear, also distal portion about $68\ \mu$ long; posterior fringe grey. Hind-wing clear with prominent dark median line and grey fringe. Abdomen: i and ii dark yellow slightly paler than pterothorax, iii to ix brownish yellow; x light brown, three pairs of spines on ix and two pairs on x dark brown.

Body sculptured; head, pterothorax and legs with distinct though incomplete reticulations; body not depressed. Head, as illustrated, wider than long, length about 0.63 of greatest width; widest just behind eyes, base constricted, this portion with transverse anastomosing lines of sculpture. Ocelli on a raised hump; eyes closely faceted. Antennae as illustrated (fig. 9), forked sense cones on iii and iv long and slender, former curved downwards and inwards, latter diverging and pointing upwards. Segment viii about twice as long and half as wide as vii; in the genotype, *D. ipomeae* Bgn., these two segments are equal in length and width.

Mouth-cone long and stout, extending just beyond posterior margin of prosternum; maxillary palpi three jointed, lengths (widths) of segments i to iii respectively about 22(6), 17(4) and 17(3) μ ; labial palpi about 14(3) μ . Pronotum as illustrated; roughly sculptured on anterior half at sides; one strong spine on each posterior angle, about $36\ \mu$ long, tip scarcely dilated, but bearing two points. Five pairs of curved sharp spines in anterior half of lateral margins, longest about $16\ \mu$ in length.

Pterothorax roughened at sides, mesonotum reticulated, metanotum partly so. Legs moderately short and stout; fore and hind femora somewhat enlarged. Hind tibiae about $154\ \mu$ long, as compared with $120\ \mu$ in *ipomeae*, and $32\ \mu$ wide in both species. Forewings broad at base, narrow at tip, extreme tip curved outwards slightly in most specimens, somewhat sabre-shaped; broadest near tip of scale, thence narrowing rapidly to end of basal third, and parallel-sided from there to tip; greatest width (including scale) $72\ \mu$, narrowest part $20\ \mu$; fringe hairs confined to distal half on anterior margin and to distal two-thirds on posterior margin, longest about $300\ \mu$. Surface of wing roughened just beyond scale; microtrichia in dark portion in transverse rows. Fore-vein of fore-wing distinct in basal fourth of wing; wing-vein setae present, about 10 to $14\ \mu$ in length; fore-vein: a group of seven equidistant setae from near base to about $140\ \mu$ beyond tip of scale, and three more in distal third, widely separated; posterior vein with three setae. Notwithstanding Bagnall's statement to the contrary, the vein-setae are present in *ipomeae* also, arranged more or less as in *venustus*, but they are slightly weaker and less conspicuous in the genotype.

Abdomen broad and heavy; segment x tubular, heavy, longitudinally grooved, about $110\ \mu$ long, $69\ \mu$ wide at base and $41\ \mu$ wide near apex at point where strong spines are borne. Segment i dorsally with 3-4 anastomosing transverse lines of sculpture; ii to viii with conspicuous minute pointed "setae" about $8\text{--}10\ \mu$ long on warts in about five rows, covering more than two-thirds of the dorsal aspect (fig. 8). Segments ii to vii with dorsal pair of slender setae about $20\ \mu$ long, a much heavier pair of curved spines near posterior angles about $34\ \mu$ long, and a pair about half as long antero-laterad of these on ii to v only; in addition, one recumbent inconspicuous seta about $22\ \mu$ long at middle of lateral margin on segments iii to vii; spines of viii as illustrated. In *ipomeae* segments vi and vii each bear a pair of curved setae near the mid-dorsal line, about $30\text{--}35\ \mu$ long, whereas those on *venustus* are weaker and only about $20\ \mu$ in length.

The spines on ix and x of the abdomen are heavier, longer and much darker in *venustus* than in *ipomeae*. On ix the dorsal, middle and ventral pairs vary from $88\text{--}112$, $96\text{--}120$, and 92 to $104\ \mu$ respectively, in *venustus*, whereas in *ipomeae* they measure about 76 , $84\text{--}88$ and $48\text{--}52\ \mu$ respectively. The spines on x: *venustus* $84\text{--}96$ and $72\text{--}84$, *ipomeae* 76 and $64\text{--}72\ \mu$. Ventrally: sternite vii bears three setae about $58\ \mu$ long on its hind margin, two close together at postero-lateral angle; just laterad of this angle segments ii to vii bear two pairs of sharp spine-like projections the longest about $13\ \mu$ in length.

Measurements of holotype (female) in mm. Length 0.8 . Head length 0.084 , width 0.132 ; prothorax length 0.108 , width 0.168 , postero-angular spines 0.036 . Prothorax length 0.18 , width 0.22 ; forewing length 0.46 width at base including scale 0.072 , beyond middle 0.020 ; abdomen length 0.54 , width 0.26 . Fore-leg: femur length 0.084 , width 0.084 ; tibia length 0.096 , width 0.036 . Antenna length $0.24\ \text{mm}$.

segment	i	ii	iii	iv	v	vi	vii	viii
length in μ	20	28	44	42	36	40	8	16
width in μ	24	24	20	20	20	16	8	4

Male (macropterous). Length 0.79 (not distended) to $1.0\ \text{mm}$. (distended). *Colour:* Very similar to that of female, anterior half of abdomen slightly paler; spines on viii of abdomen yellow, short stout spines on ix brown, stout long pair antero-laterad of these grey-brown, other setae yellow; eight short tubercles, below stout short spines of ix dark brown. Testes orange.

The male is smaller and more slender than the female, especially the abdomen, but otherwise its structure is very similar to that of the female. Segments ix and x are strongly sclerotized, and grooved longitudinally. Tergite viii bears two pairs of curved spines like those of female, about 48 to $52\ \mu$ in length and a ventro-lateral pair about $44\ \mu$ long; ix bears two short ($20\ \mu$ long by $6\ \mu$ wide) conical spines close together on a base about $16\ \mu$ long; some-

what antero-laterad of these on ix a pair of curved pointed spines about 40-72 μ long, differing strongly from the expanded blunt spines of *ipomeae*, which are only about 28 μ in length; in addition segment ix bears a pair of pointed ventro-lateral spines, curved outwards, about 60-96 μ long (60 in *ipomeae*).

Sternites iii to vii each bear a small transverse sense-area on the anterior margin, on the middle line; length about 4 μ , width about 15-20 μ on iii to vi, and 10 μ on vii. Similar sense-areas also in *ipomeae*. Posterior marginal median setae on sternite viii about 40 μ long.

Measurements of paratype (male) in mm. Length 1.0 (distended). Head length 0.064, width 0.120; prothorax length 0.112, width 0.158, postero-angular spines 0.030; pterothorax length 0.16, width 0.20; fore-wing length 0.44; width at base including scale 0.060, beyond middle 0.020; abdomen length 0.661, width 0.22. Fore-leg, femur length 0.092, width 0.048; tibia length 0.088, width 0.036.

Antenna length 0.2 mm.

segment	i	ii	iii	iv	v	vi	vii	viii
length in μ	16	32	40	36	32	36	8	12
width in μ	20	24	18	20	16	16	6	4

Described from 21 females and 10 males taken by the writer on the Zambesi River, at the Victoria Falls, in July 1939. The food-plants, kindly determined by the National Herbarium, Pretoria, were a tall shrub growing under other trees, probably *Morus* (21 ♀♀, 9 ♂♂), and *Euclea* sp. (1 ♂).

The new species differs from the genotype and only other known species of the genus *inter alia* as follows:

<i>venustus</i> spec. nov.	<i>ipomeae</i> Bagnall.
female: segment viii of antennae twice as long as vii	vii and viii equal in length
spines on segment ix of abdomen darker, longer	spines paler, shorter
male: dorso-lateral pair of spines on tergite ix pointed, about 40-72 μ in length	these spines only 28 μ long; blunt, expanded
both sexes: fore-wing with a median dark area about 320 μ long; abdomen brownish yellow	dark area only about 100 μ long; abdomen yellow

I am greatly indebted to Mr. F. Laing of the British Museum for a slide containing three females and one male (paratypes) of *Dendrothripoides ipomeae* Bagnall.